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‘THE FEELINGS.’

FOR common purposes every one understands well enough what is meant by ‘the feelings.’ The lists of them given in the text-books are pretty much alike. When, however, we come to technical definitions, we find no single formula in literature that could have given rise to the ordinary lists. Universally our subject is made to include the ‘grosser’ emotions. Almost as frequently it is used to embrace our finer moral and esthetic sentiments. By no few doctrines, and particularly by the traditional ‘trichotomy’ of mental philosophy, it is widened to cover the entire field of our likes and dislikes. Plainly, if any one succeeds in bringing ‘the feelings’ to a definite analysis, some of these usages are likely to appear inadmissible. Provisionally, therefore, I shall give the subject the widest range, and shall leave more exact definitions to be the outcome of our labor.

Our subject being given these wide limits, preparatory to anything new which I may have to offer, we may examine certain current notions regarding the feelings.

According to a favorite doctrine, the fundamental nature of a feeling consists in its ‘subjective reference’ (*cf.* Wundt, Sully, and Ladd). But since feelings enter into the mind of a child long before any concept or idea of ‘self’ or of a ‘subject’ is developed, it should be plain that there is nothing within a feeling *per se* which intimates or constitutes this alleged ‘reference to a subject.’

A doctrine closely allied to this ‘subject reference’ of the feelings conceives that a certain ultimate specific quality constitutes their distinctive nature. For instance, Professor Sully says: “All feelings thus seem reducible to pleasure and pain.” These words put the doctrine in its extreme ‘orthodox’ form. Pain and pleasure, however, always have been shadowy terms, and recent literature betrays a tendency to ‘liberalize’ them much after the fashion of modern Scripture interpretation. Some authors now use the words in a way which sets us wondering why they should continue the traditional trichotomy of mental science in their system any longer. It is probable that those who thus practically resolve feeling into the same ultimate categories of content and function as they do other phenomena of intellect and will, may really be found in closer agreement with the doctrines herein to be proposed than might be suspected from the contrast between the continued use of traditional phrases on their part, and the complete abandonment of them in these pages. But neglecting these advanced 'rationalizations' of the old doctrines, we must yet sum up these latter consistently with the bulk of traditional literature, and from this point of view their root-notion is unmistakably that our feelings *constitute* our likes and dislikes, and that the peculiar tone or quality of pain-pleasure is the indispensable 'element' or 'ingredient' in all feelings, which immediately constitutes their agreeableness or disagreeableness.

If this doctrine were true, it would vitally concern the presentative nature of feelings. It is, I think, not at all true. But since it is widely believed to be so, and is based upon one of the most persistent illusions in psychology, I am compelled to say something upon it before I can make the truth credible. Our first step toward this end must be to realize the difference between the proposition, 'Pain, of and within itself, constitutes disagreeableness,' and the quite different proposition, 'Pain is of such a nature that it compels us to think and to act in a certain way.' It is one thing to say that, if all the remaining warp and woof of our minds were shorn away, leaving pain alone, the pain *would still* constitute all that is disagreeable in life. And it is quite another thing to say that pain has such influence upon the other warp and woof as to compel it to fill in around the pain in conformity with a certain peculiar pattern, and in such a way that, when formed, the whole together constitutes disagreeableness. When thus clearly written down there are few psychologists who will support the former of these propositions. In proportion as conation, cognition, recognition, discrimination, and the like, are unraveled, the more complex do their processes appear. And at this stage of our science it should appear certain that, if disagreeableness involves any degree whatever of conation or of cognition (perception, discrimination, or recognition), it cannot be accounted for within the bare limits of any one quality alone. It is likely, therefore, that even the most loyal advocates of traditional pain-pleasure theories will eventually be driven to take refuge in our second formulation of their general doctrine.[1]

But this alternative formulation, when examined, is as likely to fall before modern criticism as is the former. Restated so as to make it general, this is that our likes, dislikes, and emotions are due *to the particular and specific influence* of pain and pleasure qualities. At once we are confronted here with an anomaly unparalleled among all other mental qualities. No psychologist to-day is inclined to say literally of other qualities that, as qualities, they determine mental events. The most 'subjective' idealist would not claim that the original events of our minds (those from outer stimulation) are determined by laws of quality. To do this would be like soberly maintaining as a cosmic necessity, that the sight of red hair must be followed by that of a white horse. Moreover, psychology is now agreed that so-called ‘associative’ mental events are not governed by quality laws. As Professor James puts it, “there is no elementary tendency of pure qualities to awaken similars in the mind.” (*Psychology*, I, p. 579.) And that there are no such tendencies between dissimilar qualities may be stated more positively. Thus it would appear, relative to other mental elements than pain and pleasure, that the doctrine of their qualities determining their compoundings has no standing in our present science.

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[1] If disagreeableness were confined to a single quality, then it would make no difference what warp and woof were woven into the rest of the pattern. It would then make no difference what we thought *about* pain, or how we comported ourselves regarding it. For instance, a child now dances with joy over sugar plums; were the agreeableness here constituted by the presence in the child's mental states of the hypothetical quality called 'pleasure,' then if this single quality were replaced throughout with pain, the other events remaining the same as before, thereupon, according to the proposition in question, the events so modified should be as disagreeable as previously they were agreeable. In other words, laughing, and shouting, and dancing, and clapping of hands under such conditions should be as mournful as now they are joyous. Similarly, sighing, sobbing, and weeping, if sprinkled o'er with Professor Sully's hypothetical pleasure condiment, ought in every case to constitute genuine realization of happiness, notwithstanding any peculiarity in their physiological effects, and their significance from the point of view of evolutionary conduct. To this we are driven if we consistently maintain that all things kin to laughing and sobbing, and all their reverberative or kinaesthetic effects, and all we think about them *and with them*, are not themselves *parts* of agreeableness and disagreeableness.

This of itself should make one hesitate about setting pain and pleasure apart as exceptions to all other qualities. And when one considers that our emotional and esthetic life does most conspicuously follow the *ordinary* laws of association, one should again suspect that the sort of underlying groundwork which accounts for ordinary association should lie behind emotional and esthetic association as well.

In spite of all this, however, there are likely to be those who will still cling to the notion that these hypothetical qualities of pain and pleasure, as such, influence mental warp and woof by some sort of function peculiarly their own. And after what I have said about ‘original events’ and ‘associative events,’ these advocates are now likely to fall back upon conative functions. Indeed, from the first this notion has been the stronghold of pain-pleasure fallacies, as well as the main source of these illusions, and is likely now to persist as the last resort before surrender. That we act as we do under pain, because we recognize pain to be pain, is a fundamental illusion, natural and inevitable to every mind until dispelled. But to-day one should easily bring one’s self round to appreciate the truth. A horse runs instinctively from fire, and a child from bears and darkness. But everybody now knows, or ought to know, that these instinctive acts are brought about by the definite adjustment, under evolutionary growth, of the creature’s nerves and muscles to its bodily preservation. Our reactions to pain have arisen in the same manner. As Professor Baldwin has lately pointed out (*Psy. Rev.*, Nov. 1894), the child withdraws its hand from the flame reflexly; or, in other words, instinctively.

It has been made in such a way that, when that particular stimulation occurs, a very complicated mechanism 'goes off' automatically. The pain is the *presentative* side of the occurrence. The pain is felt and the reaction follows involuntarily. To the naïve mind it appears as if the pain *caused* the reaction. But to conceive this is to ignore the complicated and extensive mechanism involving eye, head, arm, and a multitude of delicately adjusted muscles, nerves, and ganglia, which an infinite period of evolutionary growth has articulated to their particular function.

Looked at in this way, the naïve and traditional illusion that pain and pleasure influence our mental warp and woof, and our conduct as well, by some peculiarity of function attached to their quality *per se*, should easily vanish. The illusion once gone, the fact that all affective phenomena are specific reactions of our very complicated automatic organism speedily asserts itself. And this last proposition once firmly settled upon, the traditional pain-pleasure theories of feeling are likely to play but a declining rôle in future science. The reason for this, if the facts be but given due consideration, should be obvious. It is of the very essence of the pain-pleasure doctrines, and notoriously has been so since the days of Plato and Aristotle, that they stand for plus-minus *general conditions*. The root-notion is the same whether the general condition is one of spiritual welfare, mental efficiency, neural discharge, or locally stored energy. But the central proposition arrived at above was that the various affective reactions are not *general* at all, but are all of them extremely definite, complicated, and *particular*. In short, the root-notions in the two propositions, the traditional and the evolutionary, are diametrically and irreconcilably opposed to each other. By the traditional theory, pain stands for some sort of general balance; by the facts, pain stands for reflexes which are among the most deeply purposeful, definite, and particular in our organism. In time, therefore, the notion is likely to take full possession of science — that pain and pleasure cannot be thus at once and at the same time general and particular. This is the substance of the whole controversy in a nutshell.

In short, to sum up the situation, it should now, I think, be sufficiently apparent, that on the one hand the traditional theories of feeling were conceived before the requirements of modern science, either biological or psychological, arose, and that they belong to a past epoch; and on the other hand that pain, fear, anger, love, hate, and the other feelings, are instinctive reactions to be accounted for in the same way that we account for any and all other inherited habits. Nothing, however, so successfully dispels illusion and settles controversies as a clear exposition of the truth itself. Former theories failing us, we may, therefore, turn with encouragement to examine anew the nature of the feelings.[1]

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[1] Confined to our limited space, any discussion of theories so wide-reaching as those here involved, must appear to their advocates inadequate and perhaps unfair. If there are arguments, used by eminent authors, which to my readers it appears I have been unfair to, or have wholly overlooked, I beg them not to take this too speedily for granted. I have confined myself to what I believe to be the crucial points, irrespective of authority. For instance, I am not at all unaware that attempts have been made by Bain, Spencer, and Baldwin, to account for the particularity of affective reactions on evolutionary principles. But I have given little attention to these, partly, as above stated, from lack of space, and partly because of their manifest inefficacy when pressed with adequate criticism. The moment that Professor Bain feels bound to give an account of how, under evolution, the various affective reactions became particular, that moment he ought to be aware that they are not general; and if not general, that they cannot result from any sort of general nervous discharge such as that upon which he bases his pain-pleasure explanations. But admitting his explanations, what, indeed, are they but a plan of evolutionary differentiation by which the primitive 'general discharges,' which he assumes, *must necessarily have ceased to be general*, and have become confined to particular paths and reactions? Or again, what is it but a part of the plan by which it is commonly explained how *all* neural discharges have been particularized by slow differentiation and specialization of the one general discharge of primal protoplasm? It would scarcely seem worth while, therefore, to give much space to an explanation which, if it worked, would disprove the assumptions in whose support it is invoked.

Or, for another instance, it may be said that I have done injustice in ignoring the patient work of Mr. Marshall. But who can scientifically controvert Mr. Marshall? Until he shall have made plain how any organ can act *except* by its own stored force, he can scarcely expect us to see in his formula anything else than an excessively vague generalization of the fact that if a greater strain is put upon any organ than it can bear, pain is likely to follow. But even then we are left with the compensating formula upon our hand that stimulations which are not excessive invariably give pleasure; a formula which, notwithstanding the industry of Mr. Marshall in hunting up instances which are favorable to it, remains contradicted at first hand by instances abundantly clear, and in number simply incomputable.

Inasmuch as my treatment proposes to be different from what is traditional, I shall make it easier for my readers to follow me by first laying before them an outline of what afterwards I shall explain more fully.

A favorite doctrine bases the feelings upon pain and pleasure, and conceives that their distinctive character is given to them proportionally with the admixture of these two *qualities*. Quite to the contrary, it is my belief that the quality of the feelings in general is the least notable of their characteristics; that they need not contain any pain-pleasure at all, any more than an abstract idea; and that a feeling may be of any quality whatever.

The most distinctive psychological characteristic of the feelings — though it has close rivals — I declare to be found in their *presentative simplicity*. I do not use the word 'presentative' here in any cognitive sense, but refer to the manner in which, as mental states or pictures considered by themselves, they are made up or organized. If an artist should daub his canvas with a single color, or should stir all of his colors into one mass, that might be said to represent a feeling. If he distributed his colors into a landscape, or a portrait, that would represent a percept or concept. *A state presenting no psychic manifoldness, or qualitative variegation!* this is the chief characteristic of a feeling, described from its phenomenal side alone; and when we explain this, we do at least a good half of our task of explaining the feelings in general. The dependence of variegation upon presentative organization

Finally, it may be said that I have done injustice to Professor Wundt and his School (the latter as represented by the recent theory of Külpe). But here I have been constrained to silence as a matter of conscience. His pupil, Professor Titchener, declares that Professor Wundt's *Gefühle* are nothing at all but *Willensrichtungen*. It is admitted, however, that this view must be "teased out of the text." And it is of this task that I have felt myself incompetent.

If this view is correct, then the best it can do is to place Professor Wundt in that class of 'rationalizing interpreters' which I have already spoken of as still using the phrases of tradition while putting into them a new meaning. Read on their face value, certainly there is nothing in Professor Wundt's doctrines of pain and pleasure which should warrant us in placing them outside of that 'plus-minus' formula of 'general conditions' of some sort, against which our arguments are collectively directed.

and its independence of motor functioning (except remotely) I shall make plain further on. And, altogether, so significant is this presentative simplicity as a key to the total nature of the feelings fundamentally, that when any one asks me in general what a 'feeling' is, I am inclined to point to some primitive unorganized creature and to answer: "Whatever that is to biology, a feeling is to psychology. The one is a mass of crude protoplasm. The other is a mass of crude unorganized mental content."

It may well happen, however, that this most distinguishing trait, from the descriptive standpoint, will not be the most important one to psychology as a whole. Indeed, it will be an important part of my general thesis that the psychological importance of the feelings lies almost wholly in their functions. Relatively every state of mind may be said to have three functions.[1] The chief of these, for the purposes of this paper, is comprised in the relation of the feelings to conduct, or, technically, in their *motor-functions.* Close beside these latter must be placed their *associative functions* — those which govern their relations with the other states of mind of the same person. And above all, from a wider point of view, must be placed their *cognitive functions.*

Regarding the conduct-functions of the feelings, I maintain, in popular language, that they are 'motives.' Or more exactly, in psychological terminology, they are motor-ideas. Not only this, but they are *normal* motor-ideas. They stand precisely on a footing with all other motor-ideas. They originate in plain, everyday, bread-and-butter activities, rather than belong, as has been commonly supposed, to the accidents or the exuberances of life. In a word, broadly, I identify the feelings as the normal motor-ideas and psychic counterparts of ordinary animal instincts. I shall briefly indicate their origin, from the standpoint of cosmic evolution, and in the light of this account shall make plain the present relation of the feelings to conduct and to the rest of the mind.

As to their associative functions, and under the head of presentation in general, my thesis will declare that the feelings are governed by precisely the same laws of association and organization as are all other mental states and processes. Summarizing these, I may say that the presentative simplicity of the feelings, and the presentative complexity of percepts and concepts, are the results of different degrees of *serial stimulation*. The former is due to the fact that the feelings are the correlation of the activities of certain brain parts so constituted and so situated internally that serial stimulation of their elements is impossible. Consequently, and in accord with laws which psychology has laid hands on, and which I shall emphasize, these tracts act together continually in one simultaneous bulk, their psychic counterparts appearing in consciousness as masses of simple feeling, that is, without variegation or presentative complexity. On the other hand, the organized complexity of 'external' percepts is due to the fact that the nerve fibers of the peripheral sense organs can be, and are, stimulated individually in temporal series of vast intricacy and lawful regularity; hence the simultaneous variegation and complex manifoldness of their presentations.

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[1] Ultimately these are likely to be reduced to one.

Of the cognitive functions, though from the esthetic and the moral point of view they are by far the most important, I shall from lack of space say little or nothing. Moreover, for the same reason I must at present omit the application of my several propositions to the detailed explanation of particular emotions, sentiments, and feelings. I am aware that therein must lie the final test and profit of my work; but if I make my thoughts clear, I shall hope that the reader will himself see close at hand the end which they lead to. To complete our outline, I may say, however, of the cognitive functions of the feelings, that I conceive them to stand on the same footing with the like functions of all other mental processes, and work on the same plan to the same end.

With this outline before us, we may now examine its several propositions more fully.

The starting point of any examination into the feelings should be the feelings themselves. And the first characteristic that we discover about them by direct introspection is, that they are presentatively simple. The landscape shows parts, and a variety of qualities. In a musical chord parts are also discoverable. But naturally we next ask : Why are the feelings simple? As to this, modern psychology has shown that the primitive condition of every mind is presentatively crude. The first state of a child is a "buzzing confusion," with, of course, no sense or discrimination even of the confusion. In other words, the original condition of every mind falls within our definition of a feeling at the outset. Our inquiry, therefore, should best take the form : How do states of mind become complex ? Or : What are the laws by which the complex rises out of the simple ?

The answers to these questions are as follows : The primary fact of presentation appears to be that no single quality, constituent, or 'feeling' can be *presented with* any other, until both have previously been presented separately and in isolation. When two or more constituents have appeared separately in sufficiently close succession, thereafter they may appear together. When they do appear together, the total so formed will comprise a manifold, the *content* and *quality* of whose separate constituents will correspond, term for term, with those of the separate constituents in the original series. Also the presented *arrangement* of the separate constituents of the total manifold will depend correspondingly, term for term, upon their *time-order* in the original series. These things being true, it follows that *presentative complexity depends upon serial occurrence.*

We are driven, therefore, to examine the laws of serial occurrence. That all psychic events and processes are paralleled by corresponding neural processes is now an accepted maxim of our science. Concerning these neural events, certain laws of serial stimulation may be noted which are the direct counterparts of those laws of serial presentative occurrence which, as we have just discovered, govern the development of complex presentations from simple ones. Whenever any group of cortical elements or 'cells' are, through their incoming peripheral fibers, subjected to stimulation in individual series of any given degree of complexity, thereafter, as a result of any simultaneous stimulation of these cells, psychic presentations appear, whose manifold displays a complexity proportional to that of the original series of neural stimulations. Examples of this are abundant. Among peripheral presentations, the visual are by far the most complicated and highly organized. This happens because the eye exposes an enormous number of nerve-ends in a way permitting them to be stimulated, individually, in every direction, and in numerical series nearly infinite in order of combination and chromatic variegation. The touch nerves, of the skin, may also be stimulated, individually, in every direction and every sort of serial combination ; and it is for this reason that our touch perceptions stand next to the visual in the scale of presentative organization. It is because of the peculiar mode in which the retina and touch-nerves are thus serially stimulated that they are our special organs of space perception ; or, put otherwise, the sort of perception gained through our eyes and skin, is but the proper degree or mode of presentative organization that is correspondent to the modes of serial stimulation permissible by these organs. We have perceptions of two-dimensioned space or 'surface perceptions' from these organs simply because their nerve-ends can be stimulated serially in two directions (or, according to what I believe to be a more fundamental 'idealistic' truth, in a numerical series of the two-dimensioned order). We do not have two-dimensioned perceptions of sound, for the reason that the individual nerves of the ear are so fixed that they cannot be reached by their appropriate stimulus except in an order confined to a single direction. Our auditory perceptions take on their particular form of presentative organization, and give us scales, melodies, harmonies, and music, because of the forms of serial stimulation which are permissible to the auditory nerves through their own peculiar mechanical arrangement, and the physical nature of the sound-waves which act upon them. The nerves of smell and of taste are not commonly stimulated serially at all, but rather *en* *masse.* Consequently their sensations are simple. The presentative simplicity of the sensations from the muscles, joints, and viscera is likewise to be traced to lack of serial variety. In short, it is because of serial stimulation that the presentations of sight and of touch are spatial and highly organized, and it is because of the lack of serial stimulation that the sensations of taste, and of smell, and those from the muscles, joints, and viscera are non-spatial and presentatively unorganized.

An instructive illustration of the general hypothesis under discussion is offered by the sensations of temperature; for while the mechanical arrangement of the temperature nerves is practically the same as that of the touch nerves in the same region of skin, yet just because the touch stimulations affect one set of nerves individually in series, while the temperature stimulations affect the other set *en masse,* therefore we have highly organized spatial presentations of touch, and very simple unorganized ‘feelings’ of heat and cold. A precisely similar relation, founded on similar grounds, may be observed between the sensations received from the taste and the touch nerves of the tongue. Still other and even more beautiful illustrations of the same general character could be drawn from pain and pain nerves (granting these to exist), and from the experiences which give us the third dimension of space, were these not all too complicated for my present exposition. The above examples, however, suffice to show that throughout the entire range of our external perceptions, our hypothesis is confirmed that: *Presentative complexity depends upon serial stimulation, and everywhere the manifoldness of psychic life is proportional to the number of cortical or nerve elements that can be excited in the greatest variety of serial combinations.*[1]

With this imposing principle before us, supported by the universal testimony of our external presentations, we cannot be long in suspecting that the presentative simplicity of the internal feelings or emotions, is based upon the same general law, and is therefore the correspondent of neural activities which, for some reason, are void of serial conditions. In accord with my outline, I identify these neural activities with our instinct mechanism, and may tentatively describe this last, collectively, as a multitude of cortical, or brain cells, situated internally, and reached or stimulated alone through association fibres and in unbroken groups or masses.

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[1] For fuller elucidation of this principle, see my experimental monograph, *Our Notions of Number and Space*, Ginn & Co., Boston, 1894.

More fully to understand this, we may now consider certain demands laid upon the nervous system by the economy of animal evolution. Here we soon discover two broad requirements. On the one hand, it must preserve from generation to generation certain traits and habits of conduct permanently necessary to the race in general. On the other hand, it must keep each individual, through life and at every passing moment, in proper touch with its own special circumstances and environment. For these two purposes two opposite sorts of mechanism are demanded: one, yielding, plastic, and modifiable; the other, equally sensitive, but not to be permanently altered. A glance identifies our peripheral and our instinctive mechanisms with these two demands. The reasons are obvious why the 'peripheral' elements of the brain should be plastic. It is their function to acquire habits and knowledge from the outer world. The reasons are equally obvious why the 'instinct' mechanism should not be plastic: *To the degree that inherited traits shall be perpetuated at all, it is necessary that they be protected against experiential modification.*

The connection between these truths and what we had previously learned is direct and of the highest importance. The same serial stimulations which give us our complex percepts and concepts fulfill also the necessary biological functions of experience. The dependence of memory upon plasticity is already an established doctrine in our text-books. Serial stimulation, the development of complex presentations, and the formation of complex memory habits, work to the same end by exactly the same laws. Ultimately they are but different aspects of the same general facts. The connection between the presentative simplicity of the feelings and the preservation of hereditary and instinctive conduct should now, also, be tolerably easy to make out. Because the instincts had to be preserved, therefore their mechanism had to be non-plastic. Because non-plastic, therefore serial stimulation could have worked no modification in its presentative reactions even if its location had subjected them to serial stimulation. Because serial stimulation would then have been of no benefit, therefore this mechanism was *permitted* to be located internally, and where serial stimulation would not reach it. Why it was *profitable* for it to be located where it is, is another matter which I shall speak of presently. Whether the non-plasticity of the instinct mechanism, or the present impossibility of its serial stimulation, is the primary fact upon which the presentative simplicity of the feelings ultimately rests, I do not know. I am inclined, however, to look upon the 'mass reaction' of this mechanism as a perfectly 'normal association,' which has become permanently fixed by natural adaptation, and to believe that 'non-plasticity' is but another name for this fixation. Notwithstanding the uncertainty of these ultimate explanations, the empirical facts are plain, namely, that series, plasticity, and highly organized presentations go together; and that lack-of-series, non-plasticity, and simple feelings go together. And upon these our thesis may at present rest securely. For, summarizing the situation, it appears to hold good for our entire mental life, that: Concerning the complexity of our peripheral presentations on the one hand, and the simplicity of our instinctive feelings on the other, the whole story is one of serial stimulation throughout; *of provision for it in the one case, and provision against it in the other case.*

All this, provided of course that the feelings may be identified as the psychic counterparts of our instinctive impulses. This brings us to the crucial question: Are ordinary animal instincts *conscious* processes?

Almost universally it has been, and is now, taken for granted that instincts are unconscious functions.[1] The origin of this tradition is easily accounted for. Formerly consciousness was looked upon unquestioningly as the exclusive function of the soul, while instincts were regarded as too plainly mechanical. Above all, the obscurity of our feelings lent itself to confirm the popular view by failing to provoke contrary suspicions. In the first days of our new Psychology the notion that the cortex is the peculiar, if not the sole, organ of consciousness had unconsciously much to do with perpetuating the old belief.[1] The notion that the motor and the sensory cells, and even the motor and the sensory tracts, were separate, also helped. Consequently we still have nearly every psychologist to-day clinging to the old doctrine, even though the most of them are strenuously avoiding all unnecessary ontological assumptions. If, however, one will but pause to consider, he may soon discover that, in common with most persons, his conviction that instincts are 'insentient' is sharp and unyielding, in proportion as his account of the neural seat and mechanism of instinct is scanty and ragged.[2]

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[1] I am inclined to think that Professor Wundt, if closely questioned, would say that instincts are conscious processes. It is so difficult, however, to get his

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exact meaning that I hesitate to quote him unequivocally as Professor Titchener does in PHILOSOPHICAL REVIEW (September, '94). It is probable that Wundt, Bain, Volkmann, Schneider, Preyer, and others incline to the doctrine. But it remains true that there is no system of psychology extant in which instinct-content plays any clear or considerable rôle.

[1] Since this left a lot of unconscious ganglia which might well be supposed to account for the instincts, and thus the question of considering the cortex at the same time the organ of conscious and of unconscious instincts was not brought prominently forward.

[2] An apt illustration of the condition of the best psychology of our day relative to the subject in hand may be found in Professor James's text-book. Hunt as you will, no single passage will be discovered definitely declaring what his notion is as to the seat of the instincts, or directly discussing the question whether they are sentient or not. We are told in italics that "*the cortex is the sole organ of consciousness in man*" (I, 66). Also we are told that "if the motor cells [of the cortex] are distinct structures, they are insentient," and "if they are not distinct structures . . . their consciousness is that of kinaesthetic ideas" (II, 517). As it is impossible to reconcile *congenital* motor impulses with *kinaesthetic* ideas — for instance, to reconcile those from our 'preorganized mechanism,' which he says excite our reverberating emotions, with the kinaesthetic products of reverberation — we are compelled to infer that Professor James, with loyalty to tradition, holds the instincts to be insentient. His chapters on Instinct and Emotion unmistakably confirm this conclusion. This illustration is the more important, as Professor James has been the first to break squarely with traditional pain-

If, now, we grapple closely with the tradition, we find that it contains what, in our times, should be extraordinary difficulties. In the light of comparative biology, and of the rôle the cortex plays in the line of animal evolution, to be asked to believe that none of its influence is exerted through fixed, inherited traits, will certainly stagger the credulity of every professional biologist. I doubt if one can be found who will for a moment uphold the proposition that the human cortex, of all other neural organs, should have so wonderfully escaped all inherited motor-impulses. But, regarding this dominating organ of evolutionary conduct, itself an organ entirely of evolutionary development, to declare that one-half of it, the motor, is, and the other half, the sensory, is not the seat of instinctive impulses, is to commit one's self, as it would appear, to a proposition one degree less probable than that none of the motor impulses of the cortex are instinctive. The continuity of physiological and of mental development, and the inseparable parallel between the two, are in our day too conspicuous to permit the notion that the sensory and the motor may be so fundamentally set apart or so easily untangled. Consequently, and in view of the present overwhelming drift to the belief that the motor and sensory elements of the cortex are identical, the traditional doctrine that the ordinary complex instincts of animals are *altogether* insentient seems now extremely incredible.[1]

Broadly, we should suspect that the entire nervous system

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pleasure theories of emotion, and because the central fact of his new and penetrative doctrines bases the emotions, as does our own thesis, *fundamentally upon the instincts*. The historical significance of this fact I shall refer to later.

[1] In the *Psy. Rev.* (November, '94), Professor Baldwin, in arguing for the insentiency of instincts, lays great stress on the fact that instincts are preëminently fixed habits, and that "everybody admits that the greater the fixity of habit the less the consciousness." This latter notion, which is certainly widespread, appears to me to be utterly a delusion which I will explain further on (see p. 526, footnote). As a matter of fact, the greater or less fixity of any habit has nothing whatever to do with the question whether the habit is conscious or not. Perhaps there is no habit more inveterate than for an author to look at his paper or the sailor to look at the sea. Surely this does not make the one blind to the paper, or the other to the sea. And if the sight is, then will Professor Baldwin say it is *unconscious*, although one is *not thinking about it?*

participates in instinctive performances, and that the cortex and higher centers carry their share, in proportion to their superior size and importance among ganglia in general. And in the absence of any evidence, and indeed of any well-defined theory to the contrary, we are driven to conclude that instincts are *at least* conscious to the degree that the cortex and higher centers participate in them. Our thesis is that the feelings are the psychic counterparts of instincts; and all we have thus far said about it stands firm, therefore, the more carefully we examine into it.

To say that the feelings are the counterparts of instincts is to declare that they are inherited motor-ideas. We are, then, at this point, brought to consider the motor or 'conduct' functions of the feelings. It is now common information that the cortex is a neural center or 'field' in which are represented or 'projected' every limb and most of the muscles of the body. It is the central keyboard of our organism. If I voluntarily move my finger, I do so through excitation of a definite neural combination in the cortex; by striking, as it were, a set of keys governing the proper movement. My thesis declares that every such cortical activity has a psychic correspondent; that whatever key or set of keys is struck, there results a correlative feeling. Any keys normally exciting any movement give, when properly operated, a feeling which is the normal motor-idea of that movement.

These ideas or feelings are of every degree of complexity. The simplest of them we class with 'reflex acts.' Of this kind is the feeling of a pin-prick; the instinctive conduct here being the reflex jerking away of the hand. A degree more complicated are those occurrences which popular usage describes as 'instinctive movements.' A cat, thrown into the air, will twist itself in an unaccountable manner to light on its feet. A baseball player will perform a similar feat after a flying leap for a difficult catch. A swallow, having been confined in a way to prevent all exercise of its wings till sufficiently grown, will on its first flight go through evolutions in every way comparable to those already mentioned. Without doubt all these are examples of instinctive action accompanied with appropriate motor-feeling. Many instincts comprise highly complex events; for example, the conduct of beavers, squirrels, and birds. The fulfillment of some of these, as, for instance, the habits of hibernating and migratory animals, extends through the several seasons of the year. It is my thesis that the cortex and higher centers play a natural share in all these instinctive occurrences, and that the characteristic flutterings, twitterings, and chatterings of these creatures are accompanied by psychic motor-tending counterparts, of which our own grosser emotions are the appropriate homologues.

“Man has more instincts than any other animal.” So say our latest text-books. And I now add: “Man is capable of no conduct that is not instinctive.” Or rather, in accord with a more exact definition than is now current: “From the simplest to the most complex there is no conduct and no consciousness that is not partly instinctive.” Defining ‘instinctive’ exactly to mean ‘due to inherited tendency,’ we see on the one hand that the most ordinary visual perceptions are highly instinctive; are so, inasmuch as their retinal stimulations would continue to work mere ‘blooming confusion’ in the adult, as they do at first in the infant, were it not for those highly important hereditary influences which organize the immediate effects of the outward stimulations into formal percepts and concepts. On the other hand, we should as sharply observe that the simplest reflex is not wholly instinctive. No reflex will ‘go off’ of itself and without its share of outward stimulation. The pin must be applied before the hand will react. The feeling of the prick, therefore, is *both* instinctive and experiential. So also the hen must *see* her ducklings go into the water before she will flutter with distraction. The chick must *hear* the hawk before it will hide with terror. These sights and sounds are as much necessary parts of the total normal motor-ideas of such conduct as are the more obscure internal impulses and feelings. The parts of the cortex immediately representative of the eyes and ears and other ‘peripheral’ organs, furnish a part of the full chord of keys necessary to be excited. The 'internal' or instinctive keys furnish the remainder of the chord. Thus our manifold sensations, ideas, thoughts, concepts, emotions, and feelings, *together and inseparable,* are the normal 'motives' to our complex natural conduct. In short, our sketch shows us that in the same way that there is no absolute line between simple presentations and complex presentations, so also there is no line between simple motor-ideas and intricate motor-ideas, and none between conduct the most (mechanically) instinctive and conduct the most highly rational.

All ideas are motor-ideas. It is as necessary to a full comprehension of our thesis to recognize this truth, as to recognize its counterpart, that all instincts are conscious. In this truth, as we shall presently more fully become aware, lies their sole reason-to-be, either biologically or rationally. The notion, however, is so irreconcilable with current opinions regarding motor-ideas as to require me to clear up the conflict. The matter is so highly important that I must beg the reader's indulgence to believe that future results will justify present tediousness.

Beyond question, many ideas occur without muscular movements resulting therefrom immediately. Moreover, nearly every muscle is supplied with efferent fibers which run to it from the cortex. Are not, then, the cortical ends of these fibers the special keys of muscular action, and are not their corresponding feelings the only immediate motor-ideas?

My reply is, that discharges downward from the cortex proceed on the same plan as discharges within the cortex, or through association fibers. The nervous system has not two plans. *The same laws of neural association govern throughout, and are precisely the same whether accompanied by consciousness or not.* Undoubtedly every idea has stronger association with certain ideas than with others. It is true also that the bond of association between certain mental states is not to be broken. Likewise there are cortical impulses whose tendency is invariably to discharge downward, and through a particular set of motor fibers. But this should not obscure the fact that *any number of impulses may discharge through the same set of motor fibers, and all of them with equal directness and immediacy. It is not necessary that the same fibers be struck always by the same key or same set of keys.* As every button in the hotel rings the call-boy's bell, so an endless number of 'keys' in the brain may excite any given fiber. Theoretically, by the principles of association, *any impulse or idea may acquire the habit of discharging downward, and to any particular act whatever.* So far as can now be determined, there are no anatomical conditions which make any particular association either necessary or impossible. By acquirement, the sound of the word 'jerk' may become as spontaneously and reflexly a motor-idea of jerking the hand away, as the pin-prick is instinctively. An abstract idea of the most complex problem in geometry would serve equally well, if properly coupled. Any number of ideas may conspire to the same act under proper circumstances, but the infinitude of the motor problem springs from the fact, that the same impulses result very differently under different circumstances of mutual combination. In short, the great truth is, that at every moment the brain acts as a whole, and determines the conduct of that moment as a whole. Every cell or group of cells has a *major inclination*, instinctive or acquired, which fixedly or relatively remains constant. The actual discharge, however, is governed by the sum of influences at work at the moment of action. We discover, therefore, that the current popular notions regarding motor ideas are extremely artificial. Beyond question, the mere facts of cortical outlet cannot set the limits of definition. If only those ideas which *actually* discharge outward are to be called motor, then *all* that do so discharge must be called motor; and the definition at once becomes the sport of infinite individual and circumstantial accident, dependent on the chance 'whole' of each passing moment. Since those tendencies which incline to discharge within the cortex, guide, govern, and control those which do not — now promoting this one, now inhibiting that, and now protecting another, — therefore every one must be considered to be as directly and intimately concerned in motion as any other. Any other conception of motor-ideas is both false and artificial.[1]

Our thesis conceives our feelings to comprise a vast storehouse of instinctive motor tendencies. As our last discussion has made tolerably plain the method of their direct motor discharge, so their associational characteristics previous to discharge may next claim our attention. I have already intimated that the fundamental laws of esthetic association are the same as for psychology in general. Yet the instinctive feelings are not without marked associational peculiarities. I have noted that the instinctive feelings are presentatively simple, and have given the reason therefor. They resist the modifying effects of serial stimulations within their own mass or group-limits. For the same reason similar traits are to be observed in many of the ties formed between them and other states of mind, or in ordinary associational processes. No concrete law, however, can be given here. As there is no sharp line between instinct and reason, so there are all degrees of natural associational strength, and this too among the most complicated processes, as well as among the most simple. For reflex acts the association between the stimulation and the motor discharge is both simple and fatal. On the other hand, the instinct-habits of many animals are very complex, yet equally fixed. The stronger passions of mankind are extreme examples of the latter class. Yet, on the other hand, many of our feelings are notoriously 'associative,' vacillating, and fickle. We have no space here for concrete studies, but I may emphasize the general fact that large, unbroken 'bulks' of feeling, such as characterize even our most violent passions, *may* follow any degree whatever of associability, from the atavistic fatality of the born criminal to the facile sentiments of the poet and man of genius. In general, however, our instincts stand halfway between our vital physiological functions and our ordinary 'five senses.' Preparatory to our solution of concrete esthetic and ethical problems, we must bear in mind that even the heart's habit may be momentarily broken under strong mental influence, while esthetic tastes, barely potential at birth, may, through prolonged education and indulgence, become the vital necessities of old age. *On the whole, we must say, therefore, of the associative functions of instinctive tendencies that they work precisely like associations of equal strength gained experientially.*

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[1] It should now be apparent why the fixity of any habit of discharge has really nothing to do with whether it is conscious or not, and whence arises the illusion that it does. Before learning to play the piano, there is no instinctive connection appropriate for moving the fingers according to the visible notes. Consequently a lot of conscious reasonings and efforts must be made. When the art is learned, the sight of the notes is joined immediately to the appropriate action, that is, becomes its immediate motor-idea. The sight is of course conscious. The process is as completely conscious as at first. Only a shorter process has been substituted for a longer one. The notion that indispensable connections which were conscious at first are still active as connections, but owing to the speed of the reaction, are robbed of their conscious accompaniment, is, as I believe, the illusion which has misled Professor Baldwin and others. See reference to Baldwin's argument in footnote, p. 521.

Previous to association was the original occurrence. Naturally from this cue we should be brought to study the origin of particular instincts and feelings. But to this end some understanding of the anatomical basis of these hereditary tendencies is indispensable. For present purposes we may, perhaps, best come to it by first considering the antiquity of certain portions of the human cortex. With the exception of the skin and the alimentary canal, the brain is the oldest recognizable portion of the human body. So distinct a portion of its gross anatomy as the pineal gland dates back at least as far as the elasmobranch fishes, and has been rudimentary since the reptiles. The infundibulum goes back to the tunicates, and appears to have become rudimentary even at that early date. The development of the forebrain, from which the cortex is derived, is, however, unmistakably older than that of the mid-brain, from which the two above organs are derived. From the antiquity of these atrophied organs we may, therefore, appreciate the evolutionary relations that obtain between certain still active portions of the cortex and the motor combinations in which they now participate. *The muscles and members into which they now discharge must be of later origin than the central parts which at times participate in their innervation.*

Unmistakably this is interesting in view of our general thesis, but its fuller significance is reached if we consider the conditions of growth under which these relations have become developed. I have pointed out that the primitive condition of mind, both in the child and in the line of animal evolution, is one of presentative simplicity already in accord with our definition of 'feeling.' Given a very primitive creature without eyes, ears, nose, legs, fingers, or other special sense-organs, and at once we know that it is incapable of any such percepts and concepts as characterize our mental life. We best appreciate such a life by conceiving it to be one of feelings, pure and simple; that is, a life comprised of feelings in a small way like what ours might be if sifted out from all the 'things' and 'objects,' and thoughts about these, which commonly comprise the greater part of our experience. The common earthworm, having a simple nervous system without sense-organs, save of the single type distributed over its whole skin, may serve for an example. Starting with such a creature, let us now ask how its brain and nervous system develop, and what light this development throws upon the anatomy and psychology of instincts and feelings.

Suppose that eyes develop: they can be of no use biologically until joined in some way with the creature's motor apparatus — not until their presentations become motor-ideas. To this end, either a new and special set of motor nerves must be developed, running from the eyes to the various bodily muscles, or else the new optic fibers must be joined (by growing out from, or grafting on to it) to the old motor brain which already is properly connected. Unquestionably the latter mode was the one actually followed. With the rise of each new sense-organ, and of each new system of peripheral nerves, larger and larger grew *the additions* to the primitive brain structure. So also under morphological development of new legs and members, and minute differentiation of particular muscles, came similar additions of efferent nerves. In this process none of the older brain parts were lost. Other organs than the brain have morphologically come and gone. But its primitive portions have rather been submerged, and transformed by functional adaptation from 'peripheral' tracts to such storehouses of instinctive connections and promptings as were requisite to enable the growing organism to expand to a complex existence. It is to them that we fundamentally owe our hereditary instincts and our most characteristic emotions and feelings. When the proper circumstances arise which, as stimuli, strike down into our deeper nature, then are aroused the most vital and universal actions and passions common to human creatures. No doubt it will be as impossible to pick out and to identify all the primitive elements in our present complex architecture of feelings, as to identify their counterparts in our neural anatomy. Yet in both cases we may be certain that the identity exists. Once put upon the right track we shall unravel them more and more, and even as it is may hope presently to give no mean preliminary account of them.

This then, in brief, is the outline resulting from direct study of anatomy: A number of submerged tracts upon which are based the fixed traits common to the race, and a number of later overlying peripheral tracts, which are devoted to the more variable experience of the individual. The agreement of this with the previous demands of our thesis is sufficiently obvious to suggest unity throughout. More could not be expected within my present space.[1]

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[1] On the one hand, the professional biologist must not conceive that I imagine myself to have given an adequate presentation of this side of my subject, or fancy that all the points in this thesis are already scientifically established. And, on the other hand, those purely theoretical psychologists to whom biological arguments customarily "do not appeal," must not imagine that I have here done more than barely touch upon the vast and inexhaustible fields of psychological data which biology now offers. What I am trying to do in this paper is but to *state* a very intricate and difficult hypothesis. I am trying to bring together both from pure psychology and from general biology those main points which, as I conceive, *must* be taken account of, and brought into mutual harmony, before we can make anything like a substantial advance toward a true theory of emotion and feeling. No doubt I am making fundamental errors. But, if I mistake not, previous theories of emotion have been so inadequate, that even a sketch of the broader considerations which have got to be taken account of in future handlings of our problem will be found not without merit. It will serve as a framework for corrections, if it have no permanent value.

Some, however, may claim that a more definite account of where I conceive these primitive or instinctive tracts to be located in our fore-brain, might fairly be expected even here. As to this, I have purposely spoken of "additional brain growth" and "submerged tracts" in the vaguest possible manner. In so far as the general theory itself demands, this growth may have proceeded by literal imposition of strata upon strata, or it may have been rather by the appearance of

We have now before us, as I believe, the chief propositions for explaining the feelings generally. These are as follows. (*a*) The feelings are the normal motor-ideas of our instinctive conduct. (*b*) The brain mechanism of the instincts is non-plastic; their preservation demands this. (*c*) The distinguishing characteristic of the feelings, presentatively, is their simplicity. (*d*) This simplicity is due to the non-serial character of the stimulations which reach the instinct mechanism, and to this mechanism's lack of that plastic susceptibility which, lending itself to serial modification, is, together with the latter, requisite for presentative organization and development. Under these propositions, the feelings are brought into harmony with the same laws as govern all our mental life, and into congruent relation with evolutionary biology in general.

It remains to put these to the test of explaining the several particular feelings. This task I am compelled to leave to future writing.

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new cells and elements, here and there, and from time to time, over the whole general surface promiscuously. Or they may be confined to one specific locality. All of these propositions are conceivable; the functions of the brain are still sufficiently undetermined to leave room for them all; and I surely am not competent to settle the matter. I do not hesitate, however, to say that I incline to the latter hypothesis, though not strenuously. Embryology is just now surprisingly close to these matters, and promises soon to give us decisive evidence. (See works of His, Maule, and others.) From these it would appear that there is some reason for *guessing* that our primitive tracts are in the region of the frontal lobes. Unquestionably these lobes are *nearest* the germinal points from which the hemispheres evaginate. Moreover, from an independent source, neurology has of late given some evidence tending to show that the frontal lobes are a special seat of afferent-efferent connections such as my theory would demand. On the whole, and from similar reasons which incline Professor Wundt to place the "center of apperception" in the frontal lobes, I incline to place in that locality the primitive functions of instincts, passions, and feelings. I am not an unqualified convert to Professor Wundt's doctrine of apperception. But I hold in profound esteem his wide psychological knowledge and insight, and reverence any suggestion prompted thereby. To me, instinct and the feelings fundamentally lie at the basis of *interest*, and interest is the true root of all that Professor Wundt attributes to apperception. Whatever reasons, therefore, this learned author finds for locating apperception in the frontal lobes, I am inclined preferably to construe as evidence for their being the *chief* seat of the feelings. From the mode of growth of the hemispheres and from wider reasons I should not expect, however, that this localization would be absolute, or confined wholly within narrow limits.